

Table A-46 presents the price spread of 1975 housing sales and rentals by number of each for each price category. There is reason to believe that these price distributions have recently experienced a major upward shift.

Table A-47 provides an aging and distribution schedule of the 1976 City of Barstow housing inventory of slightly over 6,000 units. Over 80% of this inventory is less than 30 years old while about 10% is more than 40 years old. The bulk (73%) of the total inventory was added during the period 1950 to 1969.

Table A-48 details by year and type of structure the additions to the City of Barstow housing inventory from 1960 to 1976. Not available are mobile home data for the 1960-1969 period, which presumably accounts for the unit differences evident between Tables 22 and 23.

Table A-49 summarizes the 1976 City of Barstow motel room inventory by age and size of structural groupings. The bulk of the motel units (over 80%) have been added since 1950 at a gradual rate and are less than 30 years old. While the 19 motels containing 20-room units or less account for nearly 60% of the 32 total motels in the City of Barstow, they represent only about 25% of the total room units. The six motels with 61 to 100 room units each represent less than 20% of the total motels and fully 50% of the total room units. If all current proposals for new Barstow motels materialize, the room unit inventory would increase by 30% to 50% within the next two to three years.

Motels are an important ingredient to the economy of the City of Barstow providing major tax and employment bases related to transient travelers. Since occupancy rates are historically the highest during the (May-September) peak summer travel months, motel room units also become a temporary housing inventory supplement during the off-season for use of construction workers and others relocating on a temporary basis.

2.14 GOVERNMENT, INSTITUTIONAL, AND SOCIAL CONDITIONS OF BARSTOW

2.14.1 Government

The City of Barstow is the dominant entity in the study influence area. The unincorporated communities of Hinkley, Daggett, Newberry Springs and Yermo, plus special districts, community service areas and San Bernardino County agencies also play a vital role in the area's governmental fabric. For purposes of this report, all actions of the federal and state governments are assumed to pass through the relevant local agencies.

Table A-46

ESTIMATED SALES/RENTAL VOLUME

City of Barstow
1975

<u>Sales Price</u>	<u>Percentage of Sales</u>	<u>Number of Sales</u>
Less than \$15,000	20%	84
\$15,000 to \$19,999	36	150
\$20,000 to \$24,999	26	110
\$25,000 to \$29,999	10	42
\$30,000 to \$34,999	5	21
\$35,000 or More	<u>3</u>	<u>13</u>
	100%	420

<u>Monthly Rental Rate</u>	<u>Percentage of Rentals</u>	<u>Number of Rentals</u>
Less than \$50	16%	104
\$50 to \$99	20	130
\$100 to \$149	25	162
\$150 to \$199	20	130
\$200 to \$249	10	65
\$250 to \$299	7	46
\$300 or More	<u>2</u>	<u>13</u>
	100%	650

Source: Economics Research Associates.

1/ The weighted price or rent is the product of the midpoint of the price or rent interval times the percentage of the market volume for the interval.

HOUSING DISTRIBUTION BY AGE OF STRUCTURECity of Barstow
1976

<u>Year Built</u>	<u>Number of Units</u>	<u>Percentage Distribution</u>	<u>Cumulative Percentage Distribution</u>
1970-1976	516	8.5%	8.5%
1965-1969	813	13.4	21.9
1960-1964	1,493	24.6	46.5
1950-1959	2,124	35.2	81.7
1940-1949	470	7.7	89.4
1939 or Earlier ^{1/}	645	10.6	100.0
1930-1939	320		
1920-1929	335		
1919 or Earlier	85		
Total	6,065	100.0%	

Source: U.S. Department of Commerce, Bureau of the Census,
General Housing Characteristics (H-A5) 1950, and
Detailed Housing Characteristics (HC(1)-B6) 1970;
 and Economics Research Associates; EDAW, Inc. (1971-77).

^{1/} The 1939 or earlier figure of 686 units was reported in the 1970 census. The subdivision of that category was reported in the 1950 census, and does not total to the 1970 census figure, due to conversions, demolitions, etc. during the twenty-year period 1950-1970.

HOUSING UNIT AUTHORIZATIONS BY TYPE

City of Barstow
1960-1976

<u>Year</u>	<u>Total Units</u>	<u>Single- Family</u>	<u>Multiple Family Structures</u>	<u>Multiple- Family Units</u>	<u>Demolitions</u>
1960	150	144	1	6	10
1961	144	144	--	--	156
1962	130	110	4	20	7
1963	276	244	6	32	9
1964	171	151	1	20	6
1965	120	71	4	59	11
1966	126	116	4	10	4
1967	144	115	8	29	3
1968	164	92	14	72	7
1969	89	89	--	--	14
Total, 1960-1969	1,514	1,276	38	238	227

Mobile Homes

1970	4	4	--	--	--
1971	21	21	--	--	--
1972	258	40	20	57	161
1973	164	26	4	43	95
1974	29	29	--	--	6
1975	60	--	--	--	N/A
1976	140	40	--	--	N/A
Total, 1970-1976	676	160	24	100	41
					416

Source: Security Pacific National Bank, Surveys of Building Permits, 1967-1974; City of Barstow Building Department; and Economics Research Associates, EDAR, Inc.

Table A-49

SUMMARY OF MOTEL INVENTORY BY YEAR BUILT

City of Barstow
1976

Year Built	20 Rooms or Less		21 to 40 Rooms		41 to 60 Rooms		61 to 100 Rooms		Total	
	Number	Units	Number	Units	Number	Units	Number	Units	Number	Units
Prior to 1940	1	20	1	21	---	---	---	---	2	41
1940 to 1949	6	82	---	---	---	---	1	79	7	161
1950 to 1959	11	136	1	27	1	50	1	95	14	308
1960 to 1969	---	---	4	126	---	---	1	98	5	224
1970 to 1976	1	14	---	---	---	---	3	214	4	228
	19	252	6	174	1	50	6	486	32	962

Percentage Distribution

Rooms	26.2%	18.1%	5.2%	50.5%	100%
Motels	59.5%	18.7%	3.1%	18.7%	100%

Source: Economics Research Associates, and EDAW, Inc.

The City of Barstow was incorporated in 1947 and has a city manager-city council form of government. The city manager is also the executive director of the Barstow Redevelopment Agency, which has considerable potential for the future development of the city. The city's organization is illustrated in Figure A-3.

The County of San Bernardino exercises considerable influence in the Barstow area through its many departments. These are depicted in Figure A-4.

There are also a number of special districts or community service areas administered by the county, plus community service districts which are generally self-governing entities operating in the unincorporated areas. There are also independent single function agencies such as the Barstow Fire District, the Barstow Unified School District and the Barstow Park and Recreation District.

The major county service areas, community service districts and other special districts in the study area are shown in Table A-50. These districts have widely varying boundaries and budgets, varying from the Daggett Community Service District, with a tax levy of only \$3,030 in 1975-76 and with one of the higher tax rates, to Flood Control Zone 4, which covers a much larger area and consequently generates a considerable budget at one of the lower tax rates. A map of the district boundaries is available from the County Environmental Improvement Agency.

Barstow is in U.S. Congressional District No. 37, State Assembly District No. 34, and State Senatorial District No. 16.

2.14.2 Community Services

There are scores of private and public agencies providing community services in and around the Barstow area. Only the major services are briefly described below.

A. Health Facilities

The immediate Barstow area has a representative group of medical services including: one general hospital; one convalescent hospital; and one mental health clinic, plus such supporting services as five pharmacies, a clinical laboratory, and an ambulance service. There are 16 physicians and surgeons in private practice, eight dentists, three optometrists and seven chiropractors with offices in Barstow.

City of Barstow Organization Chart

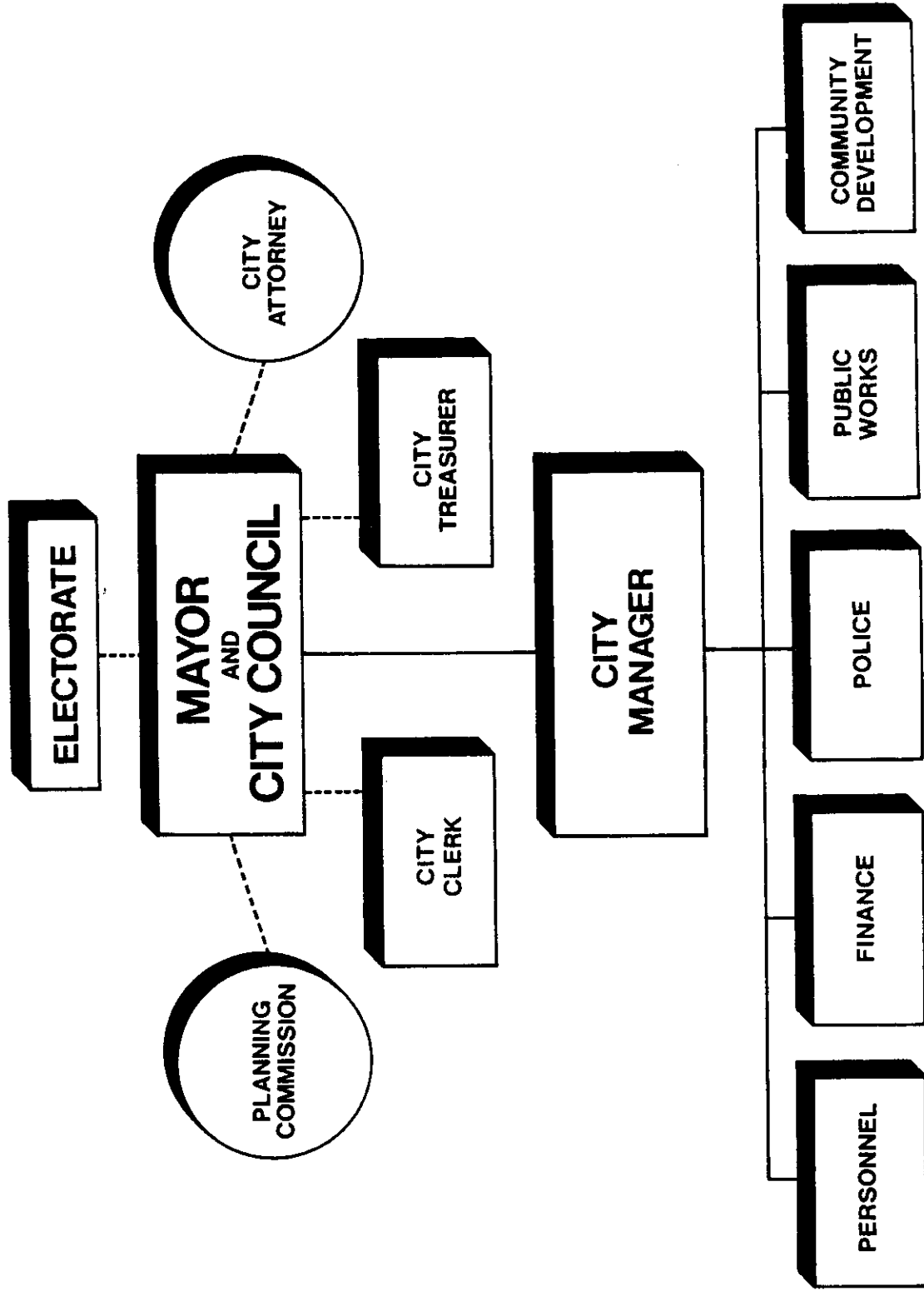
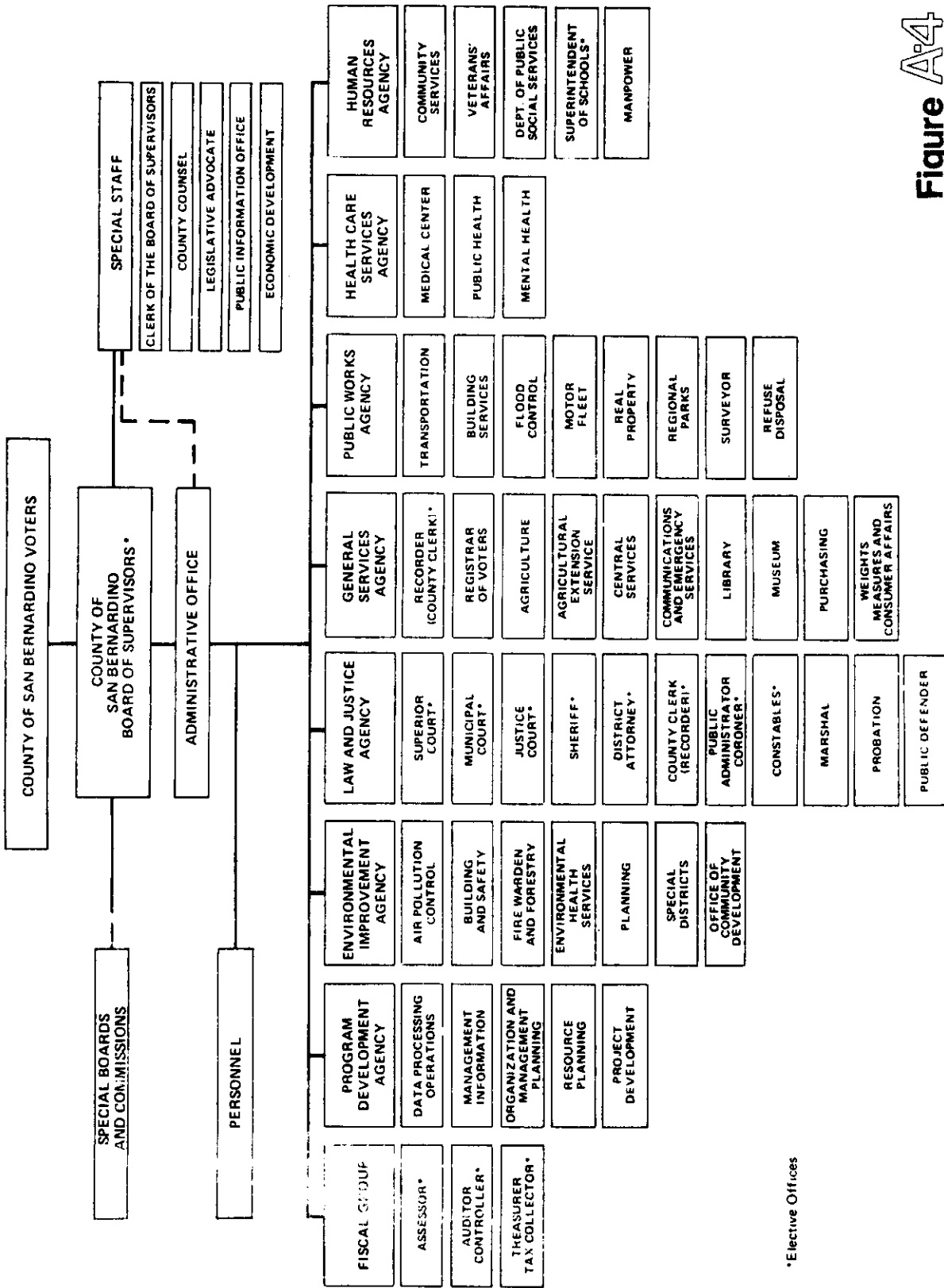


Figure A-3

County of San Bernardino Organization Chart



*Elected Offices

Figure A-4

Table A-50 Barstow Area County Service Areas
Community Service Districts and
Other Special Districts
1975-76

<u>District</u>	<u>Functions</u>	<u>1975-76 Total Assessed Value^a</u>	<u>1975-76 Tax Rate \$ per \$100^b</u>	<u>Total Tax Levy 1975-76^c</u>
Barstow Cemetery	Cemetery	\$ 63,603.1	0.076	\$ 49,237
Daggett CSD ^d	Fire, Lighting	303.0	1.000	3,030
Newberry CSD	Fire, Lighting Recreation & Parks	4,946.9	0.718	35,126
Yermo CSD	Fire, Lighting Recreation & Parks	2,990.9	0.838	24,449
Barstow Hts. CSD	-	-	-	-
Barstow Fire Protection	Fire	38,979.3	1.009	388,894
Flood Control Zone 4	Flood Control	180,548.4	0.300	541,646
Barstow Recreation and Park	Recreation	48,807.4	0.600	292,844
Mojave Water Agency	Water	130,916.0	0.117	153,172
CSA ^e 36 (Lenwood)	Lighting	2,779.9	0.211	5,885
CSA 40 ^f	TV Translator	12,983.0	0.425	55,069
CSA 70 Zone W (Hinkley)	Fire	5,269.7	0.312	16,436
<u>For Comparison Purposes:</u>				
City of Barstow		38,173.8	1.90	671,568
Barstow Community College		128,852.9	1.0326 ^g	-
Barstow Unified School District		128,852.9	4.1255 ^g	-
County of San Bernardino		2,279,309.5		67,470,149

a) Includes secured and unsecured.

b) Tax rate on secured properties only.

c) Taxes levied on secured and unsecured properties.

d) Community Services District.

e) County Service Area.

f) Dissolved 08/26/68

g) Legal limit.

Sources: Annual Reports Financial Transactions, Cities, Counties, School Districts and Special Districts of California, 1975-76; Office of the State Controller, EDAW, Inc.

San Bernardino County operates a community clinic with a full range of medical care on an outpatient basis with a staff of four physicians and other support personnel. The county's Health Care Services Agency operates clinic in Barstow for nursing services, physical therapy, and social work consultation. In addition to the Rimrock Villa Convalescent Hospital, there is a small boarding home (capacity, 10) in Grandview.

The county's Human Resources Agency through an office of the Department of Public Social Services will assist clients in the obtaining of required health services.

The major health facility is the Barstow Community Hospital, which is owned and operated by the city -- a unique arrangement for California cities. The Barstow Community Hospital opened in 1958 with a total of 26 beds. The capacity was increased to 40 beds in 1962 and again to 56 beds in 1968. This present capacity includes 43 medical-surgical beds, 10 maternity beds and three pediatric beds. According to the city's capital improvements program (approved December 6, 1976) the hospital is "currently periodically operating on a limited admissions basis because of a lack of available beds. This situation continues in spite of the fact that the city lacks sufficient professional services in the specialties of obstetrics/gynecology, pediatrics, orthopedics, urology, general surgery and family practice" (Capital Improvement Program).

In 1974, the hospital added a new medical records building, doctors' lounge and library, relocated or added business office functions, a new emergency room and a modernized radiology department.

Barstow's Capital Improvement Program recommends a comprehensive medical facilities plan to determine an accurate measure of facilities, services and personnel needed to serve the area.

The installation of a new Family Health Center was recently announced. It is expected to be 30 percent financed by federal funds and will provide a full range of health services including pediatrics and obstetrics, which were considered an unmet need in the city's recent Capital Improvements Program. The facility will add two new physicians, a part-time nurse and two licensed vocational nurses to the city's inventory of professional medical personnel (Desert Dispatch, August 6, 1977).

B. Education

Major educational agencies are the Barstow Community College and the Barstow Unified School District.

The Barstow Unified School District reported an enrollment of 8017 students as of April 15, 1977. This represents a considerable and continuing decline from recent peaks of approximately 11,000 students. These are shown in Table A-51.

Because of the expected continuing enrollment decline, the district is consolidating and closing some schools in the coming year. The two existing high schools will be combined on the Barstow High School campus, and the two existing junior high schools will be combined and relocated to the Kennedy High School campus, which will become Kennedy Junior High.

Of the 15 elementary schools, two will be closed and students transferred (Ingles to Lenwood and McKinney to Daggett). Three others will be taken out of the district to become part of the Baker Valley Unified School District.

The closed facilities may be leased temporarily but are not expected to be sold for at least five years.

Budget figures for the School District for the 1976-77 to 1977-78 period show considerable declines in federal and state and federal combined revenues. The major revenue source in 1977-78 is expected to be the state government. The second major support is from the local property tax which represents all but two percent of local funds shown in Table A-52.

The major expenditure in the district is for certificated and classified salaries or almost 84 percent of total expenditures. According to the County Superintendent of Schools, the district spent \$1,341.90 per pupil in 1975-76. This was up 37.5 percent over the \$976.09 it spent in 1971-72.

The expenditure per pupil in Barstow is 5.3 percent more than the county average for unified school districts which was \$1,274.64 in 1975-76. The range for unified school districts was a low of \$1,108.66 per A.D.A. in Yucaipa and a high of \$2,123.21 in Needles Unified.

The State Board of Education recently postponed a decision on a request to allow schools in Yermo, Daggett, Ludlow and Newberry Springs to withdraw from the Barstow Unified School District and form a proposed Silver Valley Unified School District. The proposed district would have only 725 students, well below state guidelines of 5000 students for new districts.

Table A-51 Barstow Unified School District

<u>High Schools</u>	<u>1977</u>	<u>Combined</u>	<u>Remarks</u>
Barstow	1,282	2,359	Barstow High Campus
Kennedy	1,077	-	Becomes Jr. High
Continuation Central	173	173	-
Baker High	118	-	Transfer to Baker Valley USD
<u>Jr. High Schools</u>			
Barstow	745	1,132	-
Ella Pitcher	387	-	Closed (?). Students transferred to renamed Kennedy Jr. High.
<u>Elementary</u>			
Cameron	508	508	
Crestline	365	365	
Daggett	135	317	
Henderson	447	447	
Hinkley	343	343	
Ingles	170	-	Transfer to Lenwood.
Lenwood	309	479	
McKinney	182	-	Transfer to Daggett.
Montara	528	528	
Newberry Springs	180	180	
Skyline North	371	371	
Thomsen	309	309	
Yermo	270	270	
Baker	54	-	Transfer to Baker Valley Unified School District
Mt. Pass	<u>64</u>	<u>-</u>	
TOTALS	<u>8,017</u>	<u>7,781</u>	

Source: Barstow Unified School District, Annual Budget Report.

Table A-52 Barstow Unified School DistrictIncome and Expenditures
1975-76 to 1977-78

	<u>1975-76</u> ^a	<u>1976-77</u> ^a	<u>1977-78</u> ^b	<u>1975-76 to 1977-78 % Change</u>	<u>1977-78 % Distribution</u>
<u>Income</u>					
Federal	\$ 998,300	\$ 1,099,267	\$ 781,063	- 21.8%	6.5%
State and Federal Combined	45,270	29,516	13,500	- 70.2	0.1
State	5,127,014	5,536,169	5,754,200	12.2	47.7
County	112,259	147,973	129,694	15.5	1.1
Local	5,283,321	5,650,775	5,369,080	1.6	44.5
Transfers	<u>24,564</u>	<u>28,195</u>	<u>25,000</u>	<u>1.8</u>	<u>0.2</u>
Total Income	\$11,590,728	\$12,491,895	\$12,072,537	4.2%	100.0%
<u>Expenditures</u>					
Salaries, Certificated	\$ 6,905,617	\$ 6,794,408	\$ 6,279,302	- 9.1%	52.2%
Salaries, Classified	2,365,348	2,356,352	2,360,713	- 0.2	19.6
Employee Benefits	1,162,187	1,327,807	1,422,577	22.4	11.8
Books, Supplies Equipment	675,046	700,684	721,991	7.0	6.0
Contracted Svcs. and Operations	707,261	793,466	871,287	23.2	7.2
Sites, Bldgs., Books, Equipment	172,727	268,205	55,124	-68.1	0.5
Other	<u>196,628</u>	<u>209,148</u>	<u>326,822</u>	<u>66.2</u>	<u>2.7</u>
Total Expenditures	<u>\$12,184,814</u>	<u>\$12,450,070</u>	<u>\$12,037,816</u>	<u>- 1.2%</u>	<u>100.0%</u>

Source: Barstow Unified School District, Annual Budget Report.

a - Actual.

b - Tentative.

Other private schools in the area include: Barstow Christian, Mount St. Joseph's, and Seventh Day Adventist School.

Barstow Community College

In 1975-76, Barstow Community College District covered an area with a total assessed value of \$128.9 million and had a bond debt of \$1,175,000. Average daily attendance was 1,402. The District's total income was \$2,705,902 which was derived from the following sources:

	<u>Amount</u>	<u>Percent</u>
Combined State and Federal	\$ 70,971	2.6
Federal	178,667	6.6
State	1,092,762	40.4
County	14,639	0.5
Local	1,348,863	49.9
Total:	<u>\$2,705,902</u>	<u>100.0%</u>

The District property tax generated more than \$1.2 million or 46 percent of the total budget in 1975-76.

Total enrollment is down from a peak of about 2,000 in the previous year and is not much higher than when the college opened in 1971-72. The enrollment is equally divided among nighttime, full-time and veteran students.

C. Parks and Recreation

The Barstow Park and Recreation District is a separate special district covering more than 400 square miles of the Barstow area.

The district's General Plan of Parks includes the following points:

- o Barstow is deficient in several aspects of developed recreation space.
- o Most units of the system are used primarily during the summer months.
- o During the fiscal years 1969-70 to 1974-75, the district's budget averaged \$456,000 per year but experienced a range of \$326,000 (in 1969-70) to \$808,000 (in 1972-73). The tax rate varied from \$0.4888 to \$0.6000 during the period.

- o The district's net secured valuation in 1974-75 was \$33,060,850 and total indebtedness was \$5,000.

The General Plan of Parks lists 17 park facilities for a total of more than 100 acres in the district -- four play lots or mini-parks (approximately five acres); eight neighborhood parks (approximately 41 acres, including two proposed facilities); three community parks (approximately 46 acres, including the 35-acre Foglesong Park now under development); an eight-acre ball field and a museum.

The district estimates that according to generally accepted recreation standards, it is deficient in softball, basketball, handball, racquet ball and swimming facilities.

There is considerable demand for a new pool facility. The existing Henderson Pool satisfies only 22.5 percent of the city-based demand and 11.1 percent of the market area demand. As a result, a new community swimming pool costing \$1.4 million has been proposed near the BLM Desert Way Station.

Three neighborhood centers are also needed. Because there is presently no exclusive senior citizen facility (other than a thrift shop) within the city, a 5000 square foot facility at a cost of \$265,700 has been proposed.

Presently, senior citizen groups use the Dana Park indoor facility, the Jasper Park/Nutrition Center and the Yermo Elementary School multipurpose room.

D. Other Cultural Facilities and Activities

The Community Resources Directory sponsored by the Barstow Area Human Services Council provides a very thorough description of community and cultural services which depict an active social exchange in the area.

The city is also proposing to build a 600-seat performing arts center for \$1,851,500 near the existing civic center.

E. Public Safety

Barstow has its own police department with a budget of \$674,000 in 1976-77. The department consists of 35 people including 24 sworn personnel, four dispatchers, and seven clerical personnel, plus 11 patrol cars. The San Bernardino County Sheriff's Department patrols the unincorporated areas and the California Highway Patrol covers the considerable traffic activity through the area.

Because of the extensive military presence, the FBI also has an office in Barstow.

F. Fire Protection

The Barstow Fire District covers 31 square miles and approximately 26,000 people, including Barstow and the unincorporated populated areas in and around the city.

In 1977, the district had 19 full time personnel and 48 volunteers. The district has four pumpers, one main station and three substations, plus a paramedic unit. The proposed 1977-78 budget includes replacement of a pumper and construction of a new main headquarters to replace an "inadequate" facility built in 1937. The proposed 16,000 square foot facility is expected to be completed before October, 1978.

The headquarters is proposed to be financed through the tax increment powers of the city's Redevelopment Agency. A prior application for federal public works money (administered by the Economic Development Administration in the U.S. Department of Commerce) was rejected.

The 1976-77 budget for the fire district was \$696,000. The 1977-78 revised budget is \$759,297. Permanent personnel in the 1977-78 budget remains the same as present. This includes 12 shift personnel, three dispatchers, two fire prevention officers, the chief and a secretary.

The proposed budget called for a tax rate of \$0.9856 per \$100 of assessed valuation, but following expected reductions and adjustment of a previous auditing error, the tax rate is expected to be about \$0.9 per \$100.

Estimated fire losses were \$177,660 in 1976, an increase of 32 percent over 1974. In the three years 1974-1976, one life has been lost due to fire.

The Barstow area also includes volunteer fire districts in Hinkley, Yermo, Daggett and Newberry. Hinkley has 10 volunteers and fairly new equipment. Yermo and Newberry each have 14 volunteers but their equipment is approximately 15 years old. Daggett has eight volunteer firefighters, but its operation is considered temporarily deficient at this time.

G. Transportation

The City of Barstow is an important transportation hub for railroads, trucks and passenger vehicles. The Union Pacific and Santa Fe Railroads both pass through Barstow. In addition, Southern Pacific line passes through the High Desert region to the south and west of Barstow.

Because of the natural constraints of mountain passes in the region, major national highway routes serve the area in a similar configuration as the railroads.

Table A-53 shows traffic volumes at selected locations around Barstow for Routes 15, 40 and 58. Also shown is the very minor traffic load for Route 247 which connects Barstow to Lucerne Valley.

In 1974, traffic volume dropped considerably as a result of the energy crisis, but since then traffic has apparently recovered. For example, the average daily traffic loads for Route 15 at the Townsend Street and Barstow Road interchanges declined 29 percent from 1973 to 1974. In 1976, however, volumes at the same locations have increased more than 14 percent since 1973 and more than 60 percent from the 1974 lows.

Route 15 carries more than 6.5 million vehicles per year through Barstow. It is estimated that 43 percent of this traffic is Las Vegas bound. Local, commercial and other recreation purposes amount to 17, 17 and 23 percent of the total volume.

H. Airport

The Barstow Daggett Airport, east of Barstow, is capable of general utility air service to the Barstow area. According to the San Bernardino County General Plan, a general utility airport "accommodates substantially all general aviation propeller aircraft under 12,500 pounds (gross weight). It is primarily intended to serve either communities located on the fringe of a metropolitan area or a relatively larger populated community, remote from a metropolitan area. In either case, there should be a substantial useage by aircraft having a gross weight of over 8,000 pounds." The airport is operated by the San Berardino County Department of Airports and its longest runway is 6,400 feet.

There are more than 1,000 acres available for lease and a number of buildings of varying sizes, up to 24,000 square feet, under one roof. Besides being adjacent to I-40, the airport also has a rail spur connecting to the Santa Fe mainline. It has, upon occasion, been used by the military for maintenance of aircraft and supply purposes for local training exercises at Fort Irwin or 29 Palms Marine Base.

I. Proposed Redevelopment - Barstow

The city is proposing the following housing and redevelopment projects:

Table A-53 Selected Traffic Volumes
Barstow Area Highways
1973 and 1976

	1973 ADT ^a			1976 ADT		
	Peak Hour	Peak Month	Annual	Peak Hour	Peak Month	Annual
<u>Route 15</u>						
Barstow, Townsend Street Interchange	2,050	19,600	15,700	1,950	22,400	17,900
Barstow Road Interchange	2,150	20,600	16,500	2,100	23,600	18,900
Jct. Route 13 W, Kim Road	1,600	18,000	13,500	1,900	20,900	15,700
Cost Town Road Interchange	1,550	15,800	11,900 *	1,750	17,800	13,400
<u>Route 40</u>						
E. Barstow Interchange	680	8,500	5,700	640	7,400	6,400
Main Street Interchange to Nebr. U.S.M.C. Depot	1,150	14,200	9,500	1,050	12,100	10,500
Daggett	730	9,100	6,100	700	9,000	7,000
<u>Route 58</u>						
E. of Harper Lake Road (W. of Hinkley)	430	4,250	3,850	400	4,950	3,950
(a) Fort Irwin Road between South & North Junction	720	7,200	6,500	670	7,500	6,700
First Street	610	6,200	5,600	580	6,500	5,800
Jct. Route 15, Kim Road Interchange	440	4,350	3,950	410	4,700	4,100
<u>Route 247</u>						
S. of Stoddard Wells Road	55	400	360	35	370	340
S. of Jct. Route 15	70	530	480	50	500	450

Source: California Department of Transportation.

(a) Average Annual Daily Traffic

o	CBD South Side Redevelopment	\$3,078,640
o	Riverside Drive Area Redevelopment	554,750
o	Section 7 Area Redevelopment	4,291,250
o	Santa Fe Drive Redevelopment	71,190
o	Comprehensive Housing Conservation	492,000
o	Miscellaneous Redevelopment Opportunities	750,000
		<u>\$9,237,830</u>

The South Side CBD Project includes construction of two minimal specialty centers, a junior department store and a theme tower, necessary acquisition, clearance, and rehabilitation actions, plus a 320 space parking lot.

The Riverside Drive Project will concentrate on improved circulation, water, street lighting and other public improvements.

Section 7 is a large, underutilized 320-acre area in the southern part of Barstow which will require extensive public improvements in order to encourage orderly and attractive residential development.

The comprehensive housing program calls for below market interest rate loans for residential rehabilitation through conventional financing without public liabilities.

2.14.3 Public Finance

There are numerous public agencies in the Barstow area as noted in Section III.A., but the most relevant ones for impact analysis are the City of Barstow and the Barstow Unified School District.

In general, the City of Barstow appears to be in good fiscal health. Its major concern is the heavy reliance on military and government spending for its economic base. It is also dependent on automobile tourism through the Desert and particularly to Las Vegas. Like many other cities, its budget draws considerably on state and federal support. Its present budget also calls for a large dip into prior year surpluses. However, recent development activities such as the Barstow Mall, the Santa Fe Yard, the Coolwater Plant and increasing residential projects appear to signal a healthy stimulus to the city and surrounding area.

A. City of Barstow - Revenues and Expenditures

In the 1976-77 budget for the City of Barstow, less than 14 percent of the city's revenues will come from the property tax. The largest source of the \$5.7 million budget will come from \$2.1 million in prior year surplus revenues. Other city taxes, especially the sales and use tax plus revenues from other state and federal agencies provide the bulk of revenues for the city. Table A-54 lists the 1976-77 Barstow City Budget.

On the expenditures side, the city shows a large provision for contingencies totalling \$1.6 million or 29 percent of the city budget. Public works, community development and other public improvements consume almost 41 percent of the budget for 1976-77. General government and public safety expenditures consume slightly more than a quarter of the funds.

Over the next three years (1976-77 to 1978-79), few significant increases in the present spending patterns are expected. Table A-55 shows estimated revenues and expenditures in the city's 10 major funds. The General Fund is the largest with 75 percent of all revenues and 67 percent of all expenditures in 1976-77. The \$3 million level in 1976-77 general funds almost represents a doubling since the 1971-72 fiscal year, but is expected to increase only 8.6 percent in the three-year projection period.

In addition, general fund personnel requirements will remain the same over the period, after experiencing a 15 percent increase over the 1974-75 fiscal year. The number of authorized personnel positions is shown in Table A-56.

B. County of San Bernardino - Revenues and Expenditures

The County of San Bernardino is so extensive and diverse that its finances are not directly relevant to the study without considerable manipulations. However, they are included here as a basis for comparison. Tables A-57 and A-58 of Appendix A summarize the county tax base and budget respectively.

Preliminary figures from the San Bernardino County assessor show a total 1977 assessed value of \$2.7 billion in the county, a \$424 million or 18.5 percent increase over 1976. According to the assessor, only 21 percent of the increase could be attributed to new construction. The balance is due to inflation and probably speculative pressures in the county.

Table A-54 1976-77 Budget

City of Barstow
(\$1,000's)

<u>Revenues</u>	<u>\$</u>	<u>%</u>	<u>Expenditures</u>	<u>\$</u>	<u>%</u>
<u>Property Taxes</u>	\$ 786.0	13.8%	<u>General Government</u>	\$ 779.3	13.7%
<u>Other City Taxes</u>	1,090.0	19.2	<u>Public Safety</u> ^d	674.0	11.9
Sales & Use	(869.4)	(15.3)	<u>Public Works</u>	1,066.9	18.8
Transient Occupancy	(132.8)	(2.3)	Streets	(353.6)	(6.2)
Other ^a	(87.8)	(1.5)	Water Reclamation	(302.6)	(5.3)
Licenses & Permits	91.1	1.6	Street Lighting	(102.0)	(1.8)
Fines & Penalties	62.0	1.1	Other ^e	(308.8)	(5.4)
<u>Use of Money & Property</u>	93.8	1.6	<u>Community Development</u>	278.3	4.9
<u>From Other Agencies</u>	1,039.8	18.3	<u>Debt Service</u>	178.4	3.1
Motor Vehicle	(195.0)	(3.4)	<u>Projects, Programs, Misc.</u>	960.5	16.9
SB325	(138.9)	(2.4)	Street, Traffic Signals	(655.1)	(11.5)
Gas Tax	(158.0)	(2.8)	Redevelopment	(140.0)	(2.5)
Alcohol & Cigarettes	(88.5)	(1.6)	Other ^f	(165.4)	(2.9)
Federal Revenue Sharing	(191.0)	(3.4)	<u>Revenue Sharing</u>	110.7	1.9
Housing & Community	(140.0)	(2.5)	<u>Provision for Contingencies</u>	1,634.8	28.8
Development	(20.4)	(0.4)	<u>TOTAL PLANNED EXPENDITURES</u>	<u>\$5,682.9</u>	<u>100.0%</u>
Misc. Highway					
<u>Service Charges & Other</u>	436.3	7.7			
Sewer Service	(202.0)	(3.6)			
Reimburse - Redevelopment	(141.0)	(2.5)			
Other	(93.3)	(1.6)			
<u>Surplus From Prior Years</u>	2,084.0	36.7			
<u>TOTAL REVENUE RESOURCES</u>	<u>\$5,682.9</u>	<u>100.0%</u>			

Source: City of Barstow Annual Budget 1976-1977.

Notes

- a. Franchise taxes and property transfer tax.
- b. Service charges, sewer construction fees, dial-a-ride fares, restricted reserve usage, miscellaneous.
- c. Includes \$517,002 for non-departmental and CETA.
- d. Primarily police services. Fire protection is under a special district.
- e. Includes administration, engineering, building maintenance, sanitary sewers, central garage, special projects.
- f. Includes dial-a-ride, sewer projects, professional office building.

Table A-55 Summary of Funds
City of Barstow
Three-Year Projection - 1976 to 1979
(\$1,000's)

Fund	06/30/76 Actual Balance	1976-77		1977-78		1978-79		06/30/79 Ending Balance
		Revenues	Expenditures	Revenues	Expenditures	Revenues	Expenditures	
General	\$ 633.8	\$2,977.3	\$2,977.0	\$3,056.7	\$3,290.2	\$3,232.4	\$3,256.1	\$ 377.0
Local	190.6	153.9	339.8	155.0	156.1	160.0	160.0	3.6
Transportation								
Gas Tax	203.3	165.0	360.5	168.0	177.5	171.5	178.0	(8.2)
Debt Service	56.0	178.8	178.4	185.7	183.3	192.1	191.7	57.2
Capital Outlay	356.7	5.0	180.7	230.0	286.5	5.0	136.5	(7.0)
Community	-	140.0	140.0	215.0	215.0	215.0	215.0	-
Development								
Wastewater	382.4	30.0	40.0	31.0	-	32.0	149.5	276.9
Capital Reserve								
Revenue Sharing (68.3)		191.0	161.7	200.0	98.1	200.0	186.8	76.1
Professional	329.5	21.4	32.5	24.0	28.1	24.0	28.9	309.3
Office Building								
Hospital								
Equity Fund	-	180.1	-	-	-	-	-	180.1
TOTAL	\$2,084.0	\$3,970.4	\$4,419.6	\$4,265.4	\$4,436.7	\$4,232.0	\$4,502.5	\$1,193.0

Source: City of Barstow Annual Budget 1976-1977.

Table A-56 Authorized Positions General Fund

City of Barstow

	<u>1974-75</u>	<u>1976-77</u>	<u>1978-79</u>
General Government	11.0	12.5	12.5
Public Safety	31.0	34.0	34.0
Public Works	34.0	37.6	37.6
Community Development	<u>5.5</u>	<u>9.5</u>	<u>9.5</u>
General Fund	<u>81.5</u>	<u>93.6</u>	<u>93.6</u>

Source: City of Barstow Annual Budget 1976-1977.

Table A-57 San Bernardino Countywide Tax Base

(\$ Millions)
1976-77

	<u>Secured Assessed Valuation</u>		<u>Total Secured</u>	<u>Unsecured</u>
	<u>Local</u>	<u>State</u>		
Total Gross Valuation	\$2,152.6	\$294.4	\$2,447.0	\$230.9
Less Exemptions for:				
Homeowners	227.9		227.9	0.3
Business Inventories	31.6	t	31.6	47.5
All Others	<u>82.6</u>	<u> </u>	<u> </u>	<u> </u>
Total Net Valuation	\$1,810.5	\$294.4	\$2,104.9	\$174.4
Less Allowances for:				
Delinquencies (3%)			63.1	5.2
Redevelopment Agencies			<u>22.8</u>	<u>5.0</u>
Adjusted Valuation for Current Tax Levy			\$2,019.0	\$164.2

Source: San Bernardino County Budget.

t = trace.

Table A-58 San Bernardino County Budget Summary

1976-77

<u>Fund</u>	<u>Requirements and Financing</u>	
	<u>\$ Millions</u>	<u>%</u>
General	\$129.43	50.6%
Welfare & Security	71.05	27.8
Regional Parks	2.01	0.8
Hospital Clinics	0.46	0.2
Subtotal General	<u>\$202.96</u>	<u>79.4%</u>
Roads	10.56	4.1%
Debt Service	0.52	0.2
Community Development	4.55	1.8
Special Aviation	1.90	0.7
Transportation	4.18	1.6
Federal Revenue Sharing	25.94	10.1
Federal Manpower Programs	1.44	0.6
Other Funds ^b	0.58	0.2
Subtotal Countywide (excluding General)	<u>\$ 49.67</u>	<u>19.4%</u>
County Free Library	\$ 3.03	1.2%
Subtotal Less Than Countywide Funds ^c	<u>\$ 3.03</u>	<u>1.2%</u>
Grand Total ^d	<u><u>\$255.67</u></u>	<u><u>100.0%</u></u>

a) \$65.6 million is expected to be raised through property tax at an estimated tax rate on the secured roll of \$3.0034 per \$100 assessed valuation.

b) Litter clean-up, municipal night court, fish and game, off-highway license fees, grazing, sheriff, special patrols, sales tax accumulative.

c) \$2.52 million is expected to be raised through property tax at an estimated rate of \$0.1582.

d) Totals may not add due to rounding.

Source: San Bernardino County Final Budget 1976-77.

By comparison, Barstow's assessed value increased \$5.2 million or 14.3 percent, to \$41.4 million.

2.14.4 Infrastructure - Water and Sewer Conditions in the Barstow Area (Much of the information in this section has been culled from the Comprehensive Water and Sewage Plan (April, 1972), the Barstow Capital Improvements Program (1976) and interviews with the Lahontan Regional Water Quality Control Board, the Bureau of Land Management, the County Improvement Agency and other sources.)

The existing and future condition of water and sewer facilities and activities in the Barstow area appears to be in a state of flux with differences of opinion by experts and agencies on causes and solutions. Studies are now continuing and some important decisions may be made during the next few months.

The Barstow City Manager has announced a plan for a 15-mile pipeline to carry water from the Mojave River at Helendale to Lenwood. The project is expected to assure Barstow's water needs through the year 2000. According to the preliminary report, Barstow will be out of water in 10 years if present consumption and supply conditions persist. The \$5 million project could be completed in seven years and would be considerably less expensive than constructing a pipeline to the California Aqueduct at Hesperia -- another often mentioned alternative.

The proposed project would require the drilling of seven 150-foot deep wells with a total pumping capacity of 10 million gallons per day. After pipe shipment to Lenwood, the water would either be injected into the groundwater supply or transferred directly to the Southern California Water Company pipeline which is currently under construction in the area.

The program apparently includes the incorporation of the 12-mile, 14-inch Lenwood to Barstow pipeline into the future Barstow water supply system. According to the local newspaper the line has been protested by some Lenwood and Grandview residents because of its potential to lower the existing water table in the area.

The city proposal also called for a controversial reorganization of the Mohave River County Water District, which straddles a portion of the upper and middle basins of the Mojave River and was "created several years ago primarily to protect the water rights of agricultural interests there" (Desert Dispatch, July 16, 1977).

The city's proposal also calls for elimination of the agency's general water district powers and its ability to issue bonds or engage in improvement district activity.

The second major issue in the area in addition to water supply is water quality. Just as there are differences of opinion about the future of the groundwater supply, there are also differences about the so-called Barstow slug, which is a colorful, almost pungent term for the presence of very poor quality groundwater in the area. Both issues concern the cost and responsibility for selecting alternative solutions.

Robert Dowd of the Lahontan Regional Water Quality Control Board describes the Barstow slug as the result of 60 years of water abuse. The major causes of the poor water quality include years of washing Santa Fe Railroad cars with oil and grease, thus producing phenolics which have returned to the groundwater system. The Barstow treatment plant, which now has secondary treatment, operated originally with only raw sewage stabilization lagoons, and these also infiltrated the groundwater system. Salt buildup has also been noted. The result is a stretch of very poor quality water which may be 5.5 miles long and is moving at a foot per day in the Mojave River System (Los Angeles Times, June 9, 1974).

There have been improvements in water and waste disposal systems, and there is a proposal that Southern California Edison take some of the affected water for use as cooling water at their new Coolwater plant near Daggett. A two-year joint study funded by Santa Fe, the City of Barstow, U.S.G.S. and the Water Quality Board is now under way and should help, with suitable financing, to resolve the issue. There have also been other investigations such as:

- o U.S.G.S. Water Resources Inventory Report 46-73, Feasibility of Digital Water Quality Model, illustrated by Application at Barstow (February 1974).
- o U.S.G.S. Evaluation of groundwater radiation resulting from waste disposal to alluvium near Barstow (1973) Menlo Park.
- o State Department of Public Health Barstow groundwater study wells (June, 1970).
- o Additional well data from the Department of Water Resources.

Although Fort Irwin is a federal facility, the Water Quality Board is expected to become "involved" in any changes in treatment facilities, design capacity, discharges and the like.

The following sections summarize specific information contained in the Comprehensive Water and Sewage Plan, which, although five years old, appears generally applicable to the study area.

Water

The Comprehensive Water and Sewage Plan, prepared for the County of San Bernardino and the Mountain Desert Planning Agency in April, 1972, examined 13 regions in the county. Barstow, Lenwood, Yermo, Harvard, Daggett and Newberry are in the North Desert Northeast region. The major water supply agencies in the Northeast (or Barstow) Region are listed in Table A-59.

The report notes the generally unplanned heavy reliance on groundwater supplies in most of the desert region, and the future need for supplemental water supplies, typically from the California Aqueduct. For looking at future needs, the Northeast Region was divided into three Cooperative Water Planning Zones numbered 23, 24 and 25. The groundwater supply in all zones was said to contain prominent amounts of sodium bicarbonate and an average total dissolved solids content of 300 parts per million. In Lenwood and areas south of Lenwood, there were high sodium bicarbonate-sulfate concentrations and a TDS of 600 ppm. Between Lenwood and Barstow and at Daggett, total dissolved solids were 700 parts per million and the predominant characteristic was sodium-calcium sulfate. An incursion of naturally inferior groundwaters from the north toward Barstow and east and west of Barstow was also noted, plus pollution-causing disposal of wastewater in the area with accompanying deterioration of water availability.

In the zone (#23) containing Barstow, Lenwood and the Nebo Supply Depot, a study of controlled blending of water sources was recommended, in order to reduce fluorides and total dissolved solids. If blending is unfeasible, treatment will be needed or new suitable water sources should be located.

In the zone (#24) containing Yermo, Daggett and the U.S.M.C. Depot at Yermo, consultants recommended additional system storage plus quality measures similar to Zone 23.

There were no community domestic water systems in Zone 25, but it was noted that wastewater disposal in the same areas as water wells was creating a potential public health hazard.

Table A-59 Water Supply Agencies

<u>Name</u>	<u># of Service Connections</u>	<u>Source</u>	<u>Storage Capacity</u>
Barstow Heights CSD	230	So. Cal Water Co.	3 reservoirs 0.35 mg
So. Cal Water Co. (Barstow)	5,521	9 wells	--
So. Cal Water Co. (Lenwood)	816	2 wells	--
U.S.M.C. Supply Center (Nebo)	1,300	5 wells	2 reservoirs 2.0 mg
U.S.M.C. Supply Center (Yermo)	355	4 wells	--
Bar Len Ghost Town	-	-	--
Calico Ghost Town	-	-	--
Barstow-Daggett Airport	35	-	--
Daggett Water Co.	180	2 wells	.0146 mg
East Barstow	45	well	
Hel-Bro Water	26	-	--
Santa Fe R.R.	-	well	--
Union Pacific R.R.	5	2 wells	--
Yermo Water Co.	200	4 wells	--

Source: Comprehensive Water and Sewage Plan

Sewerage

There are three wastewater collection and disposal systems other than private subsurface disposal facilities in the Barstow region. These are:

City of Barstow

Barstow-Daggett Airport

U.S. Marine Corps Supply Center (Yermo and Nebo)

In 1972, the City of Barstow had only 3000 of its 12,800 acres served by the sewer system. Of the 5000 sewer service connections, 85 percent were residential. The treatment plant, first built in 1953, consists of primary clarification followed by oxidation ponds. In 1968, the plant was expanded to its present capacity of 4.5 millions gallon per day. Average metered flow in 1969 was 1.2 million gallons per day. If the Nebo system is linked to Barstow's as recommended in the report, capacity is still expected to be adequate until 1990.

The Barstow-Daggett Airport system was designed in 1943 for a population of 1500 and was serving 150 people in 1972. The sewerage facilities consist of lagoons from which the wastewater is disposed of by evaporation and percolation. Average flow was 12,000 gpd against a capacity of 150,000 mgd.

The U.S. Marine Corps Supply Center has facilities at Yermo and Nebo to serve 5533 personnel at both places. (About 2660 of these people, however, were civilians living outside the base and not served by the depot sewerage facilities.) Both facilities provide primary and secondary treatment. The average sanitary wastewater flow from Yermo was 125,000 gallon per day in 1969 versus a capacity of 500,000; and from Nebo, 427,000 gallons per day versus 800,000 gallon daily capacity.

Water and Sewer - Barstow Capital Improvements Project

The Barstow Capital Improvement Program (CIP) proposed water and sewer projects with costs and priority are shown in Table A-60. Most of the projects have been long recommended by the city in anticipation of future expansion in the area.

The city also plans to acquire land for potential expansion of the water reclamation plant (C priority) and has called for preparation of a facilities project report for studying the supplementing of the water supply in the greater Barstow area (priority A).

According to a recent report by the Southern California Water Company, water level records for 1970 to 1976 indicate an average water level drop of 7 feet per year. If this trend continues and no surface water recharge occurs, only 7 years of groundwater supply is available; that is, supplemental water will be needed by 1983.

City officials appear confident to date that water will be forthcoming from the California Aqueduct or some other feasible alternative (Barstow City Manager, personal communication).

Flood Control

The Barstow area is in San Bernardino County Flood Control District, Area 4. A number of major flood control projects have been proposed for the southeasterly area of the city. These are listed in Table A-60.

2.15 SCENIC AND AESTHETIC QUALITIES

Fort Irwin, based on its physiography, is of one broad visual character type composed of minor mountain chains and closed basins. The dominant visual forms are: rocky mountain tops; smooth, sweeping slopes; and distinctive flat playas contrasting in color and texture with the surrounding plant community of Creosote Bush Scrub. Superimposed over much of the base is a visible network of dirt roads, trails, and tracks of military vehicles which are most numerous near the front of ranges and radiating away from the cantonment area. Many of these are permanent marks on the ground without any management program of vegetative enhancement existing to mitigate the effects of past use.

The training roads and marks left by tracked military vehicles often subdivided the landscape in such a way that the even textures of the desert are subordinated by the patterns formed by the roads. This serves to diminish somewhat the awesome qualities of scale natural to the virgin desert.

A visual evaluation of an area the size of Fort Irwin as a prerequisite for management activities typically includes the inventory and analysis of several factors. Those systems used by the U.S. Forest Service (U.S. Department of Agriculture, 1974) and U.S. Bureau of Land Management (U.S. Bureau of Land Management, 1973) center around:

- o The evaluation of the inherent scenic quality of the area.

Table A-60 Proposed Water and Sewer
and Flood Control Projects

<u>Water and Sewer Projects</u>	<u>Costs</u>	<u>Priority</u>
Grandview Interceptor	\$ 385,000	C
North Barstow Interceptor	456,600	C
Mojave Manor Interceptor	161,000	C
Lenwood Interceptor	571,303	C
Lenwood Interchange Interceptor	321,000	C
Montara Interceptor	<u>149,500</u>	C
TOTAL	<u>\$2,044,403</u>	
Lower Dean Wash Channel	\$283,300	B
Upper Dean Wash Channel	145,000	B
Section 18 Protective Level	186,750	B
Kitchen Wash Drainage Channel	146,900	B
Holiday Wash Channel	<u>124,750</u>	
TOTAL:	<u>\$886,700</u>	
Other local flood control improvements include:		
Broadway Channel	\$ 287,250	B
Other	<u>357,490</u>	B
TOTAL:	<u>\$ 644,740</u>	

Source: City of Barstow Capital Improvements Program,
1976-1982, December 1976.

- o A determination of the visual sensitivity of that area to intrusion.

A. Scenic Quality

Briefly, the scenic quality of an area is a function of the landscape features existent, the visual characteristics of those features, the extent to which they have been modified by human intrusion, and the relative uniqueness of these features within the region. Characteristics of these may be used to classify landscapes into three quality divisions: prime, choice, and common. Table A-61 lists the criteria used in determining the classification assigned to a particular landscape.

The Bureau of Land Management has labeled the Avawatz Mountains areas as "prime" in connection with a regional study covering the entire Mojave Desert. The remainder of Fort Irwin can generally be considered on a regional basis as common in inherent quality.

B. Sensitivity Levels

These are measures of people's concern for the scenic quality of a given landscape. In establishing sensitivity levels, two considerations must be addressed: the notation of points or channels from which a landscape is viewed, and the identification of the conditions under which people view the landscape. These can be used to define the landscape into three orders of sensitivity: high, moderate and low.

Fort Irwin, for all practicable purposes, cannot be viewed by the general public. This is due to its overall inward physiographic orientation and distance of the reservation boundaries from any major through roads. Hence, the post could be considered low in visual sensitivity. One exception to this is those lands on the north and east sides of the Avawatz Mountains within the viewshed of Death Valley National Monument and Route 127, a major entrance road to it. These lands could be considered of high sensitivity, as a large percentage of traffic on Route 127 is traveling to or from the Monument and hence has a major recreational concern for the scenic qualities of the area.

Table A-61 Scenic Quality Evaluation Chart*

Key Factors	Rating Criteria and Score		
	Prime	Choice	Common
Land Form	Vertical or near vertical cliffs, spires, highly eroded formations, massive rock outcrops, severe surface vegetation.	Steep canyon walls, mesas, interesting erosional patterns, variety in size & shape of land forms.	Rolling hills, foothills, flat valley bottoms.
Color	Rich color combinations variety of vivid contrasts in the color of soil, rocks, vegetation or water.	Some variety in colors and contrast of the soil, rocks & vegetation, but not dominant.	Subtle color variations, little contrast, generally muted tones. Nothing really eye-catching.
Water	Still, chance for reflections of cascading white water, dominant factor in the landscape.	Moving and in view or still but not dominant.	Absent or present but seldom seen.
Vegetation	A harmonious variation in form, texture, pattern, and type.	Some variation in pattern and texture, but only one or two major types.	Little or no variation, contrast lacking.
Uniqueness	One of a kind or very rare within region.	Unusual but similar to others within the region.	Interesting in its setting, but fairly common within the region.
Intrusions	Free from aesthetically undesirable or discordant sights and influences.	Scenic quality is somewhat depreciated by inharmonious intrusions but not so extensive that the scenic qualities are entirely negated.	Intrusions are so extensive that scenic qualities are for the most part nullified.

*Source: BLM Manual #6111.

ARCHAEOLOGICAL-HISTORICAL EXAMINATION
OF THE FORT IRWIN MILITARY RESERVATION

ARCHAEOLOGICAL-HISTORICAL EXAMINATION
of the
FORT IRWIN MILITARY RESERVATION

By: Gerald A. Smith, Curator/Director -
San Bernardino County Museum Association

Recorded history for the area encompassed by the Fort Irwin Military Reservation began with the notable journey of Father Francisco Garces in 1776. Garces probably did not travel within the boundary of the reservation, but did come within a few miles as he travelled along the Mojave River from Soda Dry Lake to the source of the river in the San Bernardino Mountains. Father Garces observed the small scattered family bands of Indians at various locations striving to exist in an area of limited food resources. He identified these people as Vanyume (Mojave River Serrano) who were of the Shohonean linguistic division. Father Jose Maria Zalvidea in 1806, and Father Joaquin Nuez in 1819, also, came close to the territory encompassed within the boundary of Fort Irwin and not only substantiated the report of Father Garces, but indicated the presence of Mojave Indian travellers from the Colorado River area along the Mojave River.

American explorers, such as Jedediah Strong Smith in 1826-1827, and Wolfskill and Young, just a few years later, travelled along the Mojave River Trail, but like the others found no reason to leave the best source of water and, therefore, probably did not set foot on Fort Irwin land.

New Mexican traders travelling from Santa Fe to Los Angeles in 1830, over what became known as the "Old Spanish Trail" and later as the Salt Lake Trail, may have crossed the eastern portion of Fort Irwin Military Reservation and watered their horses at Bitter Springs.

Perhaps the first American military man to travel near Fort Irwin was John C. Fremont in 1844.

Extensive travel through the eastern edge of the Fort Irwin Military Reservation occurred in 1851, during the period of Mormon settlement in San Bernardino Valley. The Mormon colonists used the "Old Spanish Trail" route and more than five hundred people moved through from Salt Lake. Continued travelling resulted back and forth from Utah to San Bernardino Valley.

During the 1860s, mining and stock raising activities developed on the Mojave Desert. At first, the stock raising activities were along the Mojave River.

Conflict with the small Indian groups occurring in the 1860s, and as a major road had developed along the Mojave Trail. Major James Henry Carleton, with two companies of dragoons, conducted a campaign against the Indians of the Mojave Desert. The road, which became known as the Government Road, was first surveyed by Lieutenant Amiel W. Whipple as a possible transcontinental railroad route from Fort Smith, Arkansas to the Pacific Coast in 1853-1854. In 1857-1859, the route had been traversed by Edward F. Beale, with his camel caravan. Beale marked this road as a wagon road for emigrants from the various states to California. The first emigrant wagon train to attempt to use the road was attacked by the Mojave Indians at the Colorado River. Major William Hoffman of the Sixth Infantry with five hundred soldiers was sent from California against the Mojaves. The Mojave were contained and a fort established on the Colorado River with need for supplies which had to be provided by travel over the Government Road.

Indian attacks on the freighters, travellers, and ranchers necessitated the campaign by Major Carleton. At this time, these Indians were referred to as Pah-Ute. They were probably Chemehuevi, which really is a branch of the Southern Paiute of Southern Nevada that spread out over a great portion of the Mojave Desert.

Ever since the 1830s, Indians from Utah had been raiding in southern California. On one raid alone these Indians stole approximately 3,000 of the finest horses in southern California. The route of these raids traversed the eastern edge of the Fort Irwin Military Reservation.

Three specific murders on the Salt Lake Trail were the direct causes for sending Major Carleton on the expedition against the Indians of the Mojave Desert.

The first incident was the murder of Robert Wilburn near the Mojave River on January 23, 1860. Wilburn was an employee of Bachman and Company of Los Angeles and was assigned to guard cattle on the Mojave River. Indians stole some of the cattle and Wilburn was ambushed and killed while searching for the stolen stock.

The second incident was the murder of Thomas S. Williams and the wounding of Jehu Jackman at Bitter Springs. These men were with a train of fourteen wagons travelling from Salt Lake to Los Angeles to pick up freight. Indians volunteered to show Williams where water and grass could be obtained. Both Williams and Jackman went with the Indians. The following story as quoted from the Los Angeles Star Newspaper for Sunday, March 25, 1860, created a public demand for Carleton's campaign:

MORE MURDERS ON THE MOJAVE!!!
Two Men Killed by the
Indians.
A Military Post Necessary on the
Salt Lake Road.

On Sunday afternoon, our community was thrown into a state of the greatest excitement and alarm, by the information brought to town by Mr. Jones, the Government Express rider from Fort Mojave, that two men were murdered on the Mojave by the Pi-Ute Indians. On inquiry, we find the following to be the facts of the case:

Mr. Thomas S. Williams, a gentleman well known throughout California, was bringing a train of wagons from Salt Lake City to California by the Southern route, for the purpose of carrying back freight. He was accompanied by his brother-in-law, Mr. Jehu Jackman; they had fourteen wagons in the train, with their teamsters, and a number of passengers. They had travelled to Bitter Springs in the most comfortable manner, having plenty of supplies for the journey; the Indians along the route were treated in the kindest and most liberal manner, and they behaved in all respects so as to inspire confidence in their friendly disposition.

Having arrived within the boundary of this State, (at) a place called Dry Lake, Messrs. Williams and Jackman started ahead of the train, to look out for a good station. They came to the Bitter Springs, where they were joined by four Pi-Ute Indians, who offered to guide them to good grass and water, which were found a few miles this side the springs, intending to wait there till the train came up; apprehending no danger, they were unarmed, and on the way back each took a trail a few rods apart, permitting the Indians to walk behind them. Having travelled along the road some time, Mr. Jackman happened to look back, and something in the conduct of the Indians attracted his attention, and he turned his horse to join Mr. Williams, telling him at the same time that he thought the Indians were treacherous. On this, as he stepped out of the trail, he was pierced by two arrows, as was also Mr. Williams at the same moment, the latter being struck a third time; his horse started off and bore him to camp where Mr. Williams died same night.

Mr. Jackman, on being wounded, fell from his horse, which ran away. The savages then came up and fired on him, piercing him with no less than seven arrows, two of which passed entirely through him, one entering at the abdomen and coming out near the neck; the first passed through from his back, the barb protruding in front.

The alarm being given in camp by the arrival of Mr. Williams, a party came on in search of Mr. Jackman, and found him in almost a lifeless condition from his wounds and the intense cold.

Mr. Williams was buried at Bitter Springs, and Mr. Jackman was brought to Lane's ranch on the Mojave, where he receives every care, but his wounds are of such a nature that no hope of his recovery is entertained.

Mr. Jones, who gave us the above information, met the party on the 21st, camping at the junction of the Mojave and Salt Lake roads, forty miles below Lane's ranch. The murder was perpetrated on the 18th.

These repeated murders show the necessity of having a military post established on the road -- here are three murders committed within a short period, by the Pi-Ute Indians, without any cause or quarrel.

General Clark, in command of the Department, should at once establish a military post on this road, for the protection of citizens in pursuit of their business; more especially, as valuable mines are known to exist there, which cannot be worked in consequence of the hostile Indians.

General Albert Sidney Johnston passed by Bitter Springs en route from Utah and discovered that William's body had been dug up, his clothing stolen and the body exposed.

Major Carleton was ordered to proceed to the vicinity of Bitter Springs and punish any Indians he might find.

On April 19, 1860, a detachment of Carleton's command had a fight with a group of Indians and one was killed and another captured, but later killed. These two Indians were taken to Bitter Springs and left hanging on a gallows as a warning to other Indians.

During the 1870s, the mining activities increased in the Mojave Desert and prospectors explored the area now a part

of Fort Irwin Military Reservation. In 1875, Lieutenant Eric Bergland travelled through the area exploring the possibility of diverting Colorado River Water for irrigation.

In the 1880s, silver, gold and borax mining operations were the most important activities in the Mojave Desert along with construction of the railroad line to Needles.

Marginal stock raising continued during the 1890s, and the early part of the twentieth century. Water was always a major concern and springs were developed and wells dug. Cave Spring, Leach Spring, Bitter Spring, Garlic Spring, and Langford Well became important to not only the miners and cattlemen, but also to the many travellers through the desert area.

All natural water sources were important to the historic Indians, and to the prehistoric Indians, who have lived and exploited the area now a part of the Fort Irwin Military Reservation.

An abundance of archaeological resources exist in the Mojave Desert and specially within the boundary of Fort Irwin. Only a few sites have been discovered and recorded. There is a need to make a systematic field survey and record all archaeological and historical resources within the boundary of the Fort. The known resources consist of open habitation sites, rock shelter sites, quarry sites, and perhaps unreported sites of petroglyphs, trails, rock alignments, etc.

Some known sites include lithic assemblages thought to be older than ten thousand years. The artifacts consist of choppers, flake scrapers, and bifacially flaked "coup de point-like" implements similar to those of the Old World lower paleolithic period. This cultural assemblage has been made best known by the work of Ruth D. Simpson and Dr. Louis Leakey at the Calico Early Man Archaeological Excavation.

The earliest undisputed evidence for man's presence in the Fort Irwin Military Reservation is that found along the ancient shores of the Pleistocene Lakes. The sites at Nelson Lake are excellent examples and are associated with physiographic features attributed to the cool, moist period which ended about 7,500 Before Present. The lithic assemblage is characterized by a variety of stylized scrapers, flake and oval knives, drills, leaf-shaped blades, choppers, hammerstones as well as the presence of diagnostic projectile points.

A later period extending from 5,500 to approximately 3,000 Before Present first defined by Elizabeth and William Campbell, are indicated by sites at Goldstone 1 and 2, Campbell 1 and 2, and Red Pass Lake. The diagnostic tools of this period are the Pinto Basin type projectile points. This lithic assemblage typological similarity is found throughout the Mojave Desert and the Great Basin.

From about 3,000 to 1,000 Before Present there is the occurrence of the Amargosa period. Artifacts from this period differ from the preceding Calico. Mojave and Pinto by virtue of superior lithic technique, the increment of new forms, the absence of earlier forms, and the nature of the site locations. There appears to be probably three phases to the Amargosa period, which may correlate in time with the Basketmaker periods and first Pueblo period of the Southwest.

Late and protohistoric periods are represented by cultural resources noted at existing springs. The direction of the flow of people from southern Nevada into the Mojave Desert appears westward. The historic Kawaiisu came before the Chemehuevi and the Serrano Vanyume even before them. All may have crossed the area now known as Fort Irwin and gathered food resources and used the water from the springs that still exist. The nomadic movement of the Indians formed a regular and orderly cycle carried out systematically and with rhythm in step with the seasonal changes which ushered in certain food resources that could be utilized for sustenance.

The known cultural resources in the Fort Irwin Military Reservation can contribute to a better understanding of our historic and prehistoric past. Several of the sites will meet the criteria for being listed in the National Register of Historic Places.